United States Patent [19]

Baker et al.

[11] **Patent Number: 4,578,674**

[45] **Date of Patent: Mar. 25, 1986**

[54] **METHOD AND APPARATUS FOR WIRELESS CURSOR POSITION CONTROL**

[75] Inventors: **David C. Baker**, Austin, Tex.; **David F. Bantz**, Chappaqua, N.Y.; **Gregory A. Flurry**, Austin, Tex.

[73] Assignee: **International Business Machines Corporation**, Armonk, N.Y.

[21] Appl. No.: **486,630**

[22] Filed: **Apr. 20, 1983**

[51] **Int. Cl.**[4] **G09G 1/00**

[52] **U.S. Cl.** ..... **340/710**; 340/365 P; 178/18; 455/603

[58] **Field of Search** ..... 340/709, 710, 365 P, 340/365 R, 365 VL, 712; 455/617, 603; 178/18-20

[56] **References Cited**

U.S. PATENT DOCUMENTS

3,504,334	3/1970	Turnage	340/16
3,541,521	11/1970	Koster	340/710
4,103,278	7/1978	Satake et al. .	
4,151,407	4/1979	McBride et al.	455/617
4,156,134	5/1979	Minner	455/603
4,313,183	1/1982	Saylors	367/128
4,426,738	1/1984	Sato	455/603

FOREIGN PATENT DOCUMENTS

8030151.7 9/1980 European Pat. Off. .

OTHER PUBLICATIONS

William M. Newman and Robert F. Sproull, "Principles of Interactive Computer Graphics", McGraw-Hill Company, 2nd Edition, pp. 154-155.

PCT/US81/00995, 2/18/82, Howells et al.

Funk, B. D., "CCDs in Optical Touch Panels Deliver High Resolution, (9/80), pp. 139-143, *Electronic Design*, vol. 28.

Lyon, R. F. et al, "Designing and Testing the Optical Mouse," *VLSI Design*, pp. 21-26 (Jan./Feb. 1982).

Fields, S. W., "Mouse Tracks Path by Electronics Only," *Electronics International*, vol. 55, No. 1, (Oct. 1982).

Primary Examiner—Marshall M. Curtis

Attorney, Agent, or Firm—George E. Clark; Alexander Tognino

[57] **ABSTRACT**

A method and apparatus for wireless cursor position control is disclosed herein. The apparatus comprises a wireless cursor position device and a separate control base whereby the direction and velocity of motion of the position device is monitored by the control base and used said direction and velocity of motion is to calculate the relative motion of the cursor on the display system. The method and apparatus operates by transmitting and receiving ultrasonic and infrared signals between the position device and control base and thereby calculating the movement of the position device from an initial location by measurement doppler shift of the signals. An output signal to the display system is then generated to move the cursor in correspondence with the motion of the position device.

8 Claims, 8 Drawing Figures